



## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

[Docket No. 210806-0159]

RTID 0648-XW032 and 0648-XW013

### **Listing Endangered and Threatened Wildlife; 12-Month Findings on Petitions to List Spring-run Oregon Coast Chinook Salmon and Spring-run Southern Oregon and Northern California Coastal Chinook Salmon as Threatened or Endangered Under the Endangered Species Act**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notice of 12-month petition findings.

**SUMMARY:** We, NMFS, announce 12-month findings on 2 petitions to list populations of spring-run Chinook salmon (*Oncorhynchus tshawytscha*) as threatened or endangered Evolutionarily Significant Units (ESUs) under the Endangered Species Act (ESA) and to designate critical habitat concurrently with the listings. We have completed a comprehensive analysis of Oregon Coast (OC) and Southern Oregon and Northern California Coastal (SONCC) spring-run Chinook salmon populations in response to the petitions. Based on the best scientific and commercial data available, including the ESU configuration report, we have determined that listing the OC and SONCC spring-run Chinook salmon populations as threatened or endangered ESUs is not warranted. We determined that the OC and SONCC spring-run Chinook salmon populations do not meet the ESU Policy criteria to be considered ESUs separate from the OC and SONCC fall-run Chinook salmon populations and, therefore, do not meet the statutory definition of a species under the ESA. We also announce the availability of an ESU configuration report we prepared to inform our determination.

**DATES:** These findings were made on [*insert date of publication in the **FEDERAL REGISTER***].

**ADDRESSES:** The documents informing the 12-month findings, including the ESU configuration report (Ford *et al.* 2021), are available by submitting a request to the Assistant Regional Administrator, Protected Resources Division, West Coast Regional Office, 501 W. Ocean Blvd, Suite 4200, Long Beach, CA 90802, Attention: OC and SONCC spring-run Chinook salmon 12-month Findings. The documents are also available electronically at [https://www.fisheries.noaa.gov/protected-resource-regulations?title=&field\\_species\\_vocab\\_target\\_id=Chinook+Salmon&sort\\_by=field\\_relevant\\_date\\_value](https://www.fisheries.noaa.gov/protected-resource-regulations?title=&field_species_vocab_target_id=Chinook+Salmon&sort_by=field_relevant_date_value).

**FOR FURTHER INFORMATION CONTACT:** Gary Rule, NMFS West Coast Region at [gary.rule@noaa.gov](mailto:gary.rule@noaa.gov), (503) 230-5424; or Heather Austin, NMFS Office of Protected Resources at [heather.austin@noaa.gov](mailto:heather.austin@noaa.gov), (301) 427-8422.

## **SUPPLEMENTARY INFORMATION:**

### **Background**

On September 24, 2019, the Secretary of Commerce received a petition from the Native Fish Society, Center for Biological Diversity, and Umpqua Watersheds (hereafter, the OC Petitioners) to list OC spring-run Chinook salmon as a threatened or endangered ESU under the ESA. Currently, OC spring-run Chinook salmon populations are part of the OC Chinook salmon ESU that combines populations of spring- and fall-run Chinook salmon and is not listed under the ESA. The OC Petitioners request that OC spring-run Chinook salmon be considered as a separate ESU and listed as threatened or endangered. The OC Petitioners also request the designation of critical habitat for OC spring-run Chinook salmon concurrent with ESA listing. On April 13, 2020, we published a positive 90-day finding (85 FR 20476) (RTID 0648-XW013) announcing that the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted. In our 90-day

finding, we also announced the initiation of a status review to determine whether the spring-run populations of OC Chinook salmon constitute an ESU, and, if so, whether that OC spring-run Chinook salmon ESU is in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range; and we requested information to inform our status review.

On May 4, 2020, the Secretary of Commerce received a petition from Richard K. Nawa (hereafter, the SONCC Petitioner, or Petitioners when referring collectively to the OC Petitioners and the SONCC Petitioner) to identify SONCC spring-run Chinook salmon as a separate ESU and list the ESU as threatened or endangered under the ESA. Currently, SONCC spring-run Chinook salmon populations are part of the SONCC Chinook salmon ESU that combines populations of spring- and fall-run Chinook salmon and is not listed under the ESA. The SONCC Petitioner requests that SONCC spring-run Chinook salmon be considered as a separate ESU and listed as threatened or endangered. The SONCC Petitioner also requests the designation of critical habitat for SONCC spring-run Chinook salmon concurrent with ESA listing. On March 16, 2021, we published a positive 90-day finding (86 FR 14407) (RTID 0648-XW032) announcing that the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted. In our 90-day finding, we also announced the initiation of a status review to determine whether the spring-run populations of SONCC Chinook salmon constitute an ESU, and, if so, whether that SONCC spring-run Chinook salmon ESU is in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range; and we requested information to inform our status review.

### **Listing Species Under the ESA**

We are responsible for determining whether species under our jurisdiction are threatened or endangered under the ESA (16 U.S.C. 1531 *et seq.*). To make this determination, we first consider whether a group of organisms constitutes a “species” under

section 3 of the ESA (16 U.S.C. 1532), and then, if so, consider whether the status of the species qualifies it for listing as either threatened or endangered. Section 3 of the ESA defines species to include any subspecies of fish or wildlife or plants, and any distinct population segment (DPS) of any species of vertebrate fish or wildlife which interbreeds when mature. In 1991, we issued the Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon (“ESU Policy”; 56 FR 58612; November 20, 1991), which explains that a Pacific salmon population unit will be considered a DPS, and hence a “species” under the ESA, if it represents an “evolutionarily significant unit” of the biological species. The two criteria for delineating an ESU are: 1) It is substantially reproductively isolated from other conspecific population units; and 2) it represents an important component in the evolutionary legacy of the species. The ESU Policy is used exclusively for delineating distinct population segments of Pacific salmon. A joint NMFS–U.S. Fish and Wildlife Service (USFWS) (jointly, “the Services”) policy clarifies the Services’ interpretation of the phrase “distinct population segment” for the purposes of listing, delisting, and reclassifying a species under the ESA (“DPS Policy”; 61 FR 4722; February 7, 1996). In announcing this policy, the Services indicated that the ESU Policy for Pacific salmon was consistent with the DPS Policy and that NMFS would continue to use the ESU Policy for Pacific salmon.

Section 3 of the ESA further defines an endangered species as any species which is in danger of extinction throughout all or a significant portion of its range and a threatened species as one which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Thus, we interpret an “endangered species” to be one that is presently in danger of extinction. A “threatened species,” on the other hand, is not presently in danger of extinction, but is likely to become so in the foreseeable future. In other words, the primary statutory difference between a threatened and

endangered species is the timing of when a species may be in danger of extinction, either presently (endangered) or in the foreseeable future (threatened).

Section 4(a)(1) of the ESA also requires us to determine whether any species is endangered or threatened as a result of any of the following five factors: The present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence (16 U.S.C. 1533(a)(1)(A)–(E)). Section 4(b)(1)(A) of the ESA requires us to make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and after taking into account efforts being made by any state or foreign nation or political subdivision thereof to protect the species. In evaluating the efficacy of formalized domestic conservation efforts that have yet to be implemented or demonstrate effectiveness, we rely on the Services’ joint Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE; 68 FR 15100; March 28, 2003).

### **Status Review**

As part of our review of the Petitioners’ requests to delineate the OC and SONCC spring-run Chinook salmon ESUs and list them as threatened or endangered under the ESA, we formed an expert panel (Panel) consisting of scientists from NMFS Northwest Fisheries Science Center and Southwest Fisheries Science Center. We asked the Panel to provide: (1) an analysis and review of the Petitioners’ claims that OC and SONCC spring-run Chinook salmon populations should be considered ESUs; and, if any new ESUs were identified, (2) a description of the demographic risks (*i.e.* abundance, productivity, spatial distribution and diversity) of the new ESUs. The first task was for the Panel to compile the best available scientific and commercial information relevant to re-evaluating the ESU structure of the OC and SONCC Chinook salmon ESUs, including information provided by the Petitioners.

Specifically, the NMFS West Coast Region (WCR) requested the Panel use the criteria in the ESU Policy (56 FR 58612; November 20, 1991) to evaluate whether the OC and/or SONCC spring-run Chinook salmon populations should be considered ESUs. If the Panel concluded that one or both of the spring-run Chinook salmon populations should be considered a separate ESU, and the WCR concurred, the Panel would complete the second task of describing the demographic risks, and submit their report on both tasks to the WCR. If the Panel concluded, and WCR concurred, that there should not be a change in the current ESU structure for either ESU (*i.e.*, the spring-run Chinook salmon are part of the current ESU), the Panel would finalize their ESU structure findings and submit a report to the WCR. Under this second scenario, the Panel would not conduct a demographic risk analysis of the OC or SONCC spring-run Chinook salmon.

In order to complete their ESU analysis, the Panel considered a variety of scientific information from the literature, unpublished documents, and direct communications with researchers working on the genetics of Chinook salmon, as well as information submitted to NMFS in response to the 90-day findings on the petitions. Information that was not previously peer-reviewed was formally reviewed by the Panel. The Panel evaluated the information provided by the Petitioners and considered additional factors that may contribute to our understanding of the evolutionary significance of run-timing in Chinook salmon.

The Panel's draft report was subjected to independent peer review as required by the Office of Management and Budget (OMB) Final Information Quality Bulletin for Peer Review (M-05-03; December 16, 2004). The draft report was peer reviewed by three independent specialists selected from the academic and scientific community, with expertise in the genetic diversity and biology of salmonids. The peer reviewers were asked to evaluate the adequacy, appropriateness, and application of data used in the report. Of the three peer reviewers, two responded with written comments and the third responded informally that

they had no comments. All peer reviewer comments were addressed prior to dissemination and finalization of the draft report and publication of these 12-month findings.

We subsequently reviewed the report, its cited references, and peer review comments, and believe the report, which informs our 12-month findings, provides the best available scientific and commercial information on the OC and SONCC Chinook salmon ESUs. Much of the information discussed below is attributable to the report. However, in making the 12-month findings determination, we have independently applied the statutory provisions of the ESA, our regulations regarding listing determinations (50 CFR part 424), and our ESU Policy.

### **Previous Federal Actions**

On March 9, 1998, following completion of a comprehensive status review of Chinook salmon (*O. tshawytscha*) populations in Washington, Oregon, Idaho, and California, we published a proposed rule to list seven Chinook salmon ESUs as threatened or endangered under the ESA (63 FR 11482). In this proposed rule, we identified the OC Chinook salmon ESU as comprised of coastal populations of spring- and fall-run Chinook salmon from the Elk River north to the mouth of the Columbia River (63 FR 11482, March 8, 1998). We did not propose to list the OC ESU of Chinook salmon under the ESA, concluding that the ESU was neither in danger of extinction nor likely to become endangered in the foreseeable future.

On September 16, 1999, following an updated status review for four Chinook salmon ESUs, we published a final rule to list two Chinook salmon ESUs as threatened under the ESA (64 FR 50394). In this 1999 final rule, we identified the SONCC Chinook salmon ESU as composed of coastal populations of spring- and fall-run Chinook salmon from Euchre Creek, Oregon, through the Lower Klamath River, California (inclusive) (64 FR 50394, September 16, 1999). After assessing information concerning Chinook salmon abundance, distribution, population trends, and risks, and after considering efforts being made to protect

Chinook salmon, we determined in this 1999 final rule that the SONCC ESU of Chinook salmon did not warrant listing under the ESA.

### **Evolutionary Significant Unit Analysis**

The Petitioners requested we delineate and list the OC and SONCC spring-run Chinook salmon populations as ESUs. As described above, the ESU Policy requires the consideration of two elements when deciding whether a population unit is an ESU: (1) It is substantially reproductively isolated from other conspecific population units; and (2) it represents an important component in the evolutionary legacy of the species. The first criterion, reproductive isolation, refers to restricted interbreeding among populations. Such isolation does not have to be absolute, but it must be strong enough to permit evolutionarily important differences to accrue in different population units. Information that can be useful in determining the degree of reproductive isolation includes documentation of fish straying from one population to another, recolonization rates of other populations, the efficacy of natural barriers to migration, and measurements of genetic differences between populations. Each of these types of information has its limitations. Identification of physical barriers to genetic exchange can help define the geographic extent of distinct populations but reliance on physical features alone can be misleading in the absence of supporting biological information. Documentation of straying between populations can provide information about the movements of individual fish but not the genetic consequences of migration. Furthermore, measurements of current straying or recolonization rates provide no direct information about the magnitude or consistency of such rates in the past. In this respect, data from the analysis of genetic variation between individuals or groups of fish can be very useful because they reflect levels of gene flow that have occurred over evolutionary time scales.

To be considered an ESU, the population must also represent an important component in the evolutionary legacy of the species. The evolutionary legacy of a species is the genetic



variability that is a product of past evolutionary events and which represents the reservoir upon which future evolutionary potential depends. This second criterion would be met if the population contributed substantially to the ecological/genetic diversity of the species as a whole. In other words, if the population became extinct, would this event represent a significant loss to the ecological/genetic diversity of the entire species? In making this determination, the following questions are relevant:

1. Is the population genetically distinct from other conspecific populations?
2. Does the population occupy unusual or distinctive habitat?
3. Does the population show evidence of unusual or distinctive adaptation to its environment?

Several types of information are useful in addressing these questions. Again, the strengths and limitations of the information will be considered in making the determination. Phenotypic/life-history traits, such as size, fecundity, and age and time of spawning may reflect local adaptations of evolutionary importance, but interpretation of these traits is complicated by their sensitivity to environmental conditions. Data from DNA analysis provides valuable insight into levels of overall genetic differentiation among populations but in many cases does not contain direct information regarding the extent of adaptive genetic differences. Habitat differences suggest the possibility for local adaptations but do not prove that such adaptations exist.

#### *Methods for Analyzing Genetic Variation*

Genetic variability within and between populations of Chinook salmon generally falls into two categories: neutral and adaptive genetic variation. Most of the variation in a species' genome (the sum total of an organism's DNA) has no influence on survival or reproduction, and hence is considered to be selectively neutral. Examining patterns of selectively neutral variation among individuals in populations is very useful for understanding the relationships between those individuals and the histories of the populations. For example, neutral variation

can be used to estimate the degree of gene flow or interbreeding among different populations, or the familial relationships among specific individuals. Adaptive genetic variation refers to genes or regulatory regions of the genome that have an effect on fitness (survival or reproduction). Adaptive genetic variation occurs when certain DNA sequence variants in a population help some members survive or reproduce better than others.

#### *Reproductive Isolation Criterion*

The 1998 and 1999 coastwide status reviews for Chinook salmon focused on patterns of neutral genetic variation and did not consider differences in run timing (adaptive genetic variation) alone to be indicative of substantial reproductive isolation. This conclusion was due in part to the observed patterns of genetic variation, in which spring-run and fall-run fish spawning in the same or nearby rivers were genetically similar to each other and more similar to each other than to populations of either run type spawning in geographically distant rivers (Myers *et al.* 1998; Busby *et al.* 1999). The Panel reviewed subsequent genetic studies and found that they clearly confirm the earlier findings that, as a group, coastal spring-run Chinook salmon are not a distinct evolutionary lineage within the species, but rather share their evolutionary history and most of their genetic variation with the fall-run Chinook salmon spawning in the same and nearby rivers. In other words, the patterns of genetic variation coastwide indicate that spring-run Chinook salmon spawning in different rivers are generally more differentiated from each other than they are to co-occurring fall-run Chinook salmon.

Although this pattern is apparent when viewed on a coastwide scale, it is important to note that most of the coastwide Chinook salmon genetic studies conducted over the past two decades had few samples from the OC and SONCC areas. The Oregon Department of Fish and Wildlife identified up to nine rivers in the currently defined OC Chinook salmon ESU as having either spring-run populations or a spring-run or summer-run component to a population, but no genetics study has included more than three spring-run or summer-run

population samples, and spring-run or summer-run samples have only been analyzed for a total of four OC river systems: Nehalem, Trask, Siletz, and Umpqua rivers. Following a review of the available information, the Panel found that some of the samples from co-occurring spring-run and fall-run populations in the OC areas do not necessarily seem to be closely genetically related. In particular, Umpqua River spring-run (sampled from the Rock Creek hatchery) tend to cluster with SONCC samples of both run types in a number of studies rather than with Umpqua fall-run samples or other OC fall-run samples (Myers *et al.* 1998; Waples *et al.* 2004; Seeb *et al.* 2007; Narum *et al.* 2008; Clemento *et al.* 2014; Hecht *et al.* 2015; note that some studies used the same set of samples so these data are not all independent). This pattern could indicate that Umpqua River spring-run Chinook salmon are in fact historically more closely related to SONCC Chinook salmon, or could be a result of past broodstock transfers from the Rogue River (and elsewhere) into the Rock Creek Hatchery (as summarized by Myers *et al.* 1998, Appendix D). In addition, fall-run samples from the Trask River Hatchery were more closely related to other OC fall-run samples than to Trask River Hatchery spring-run samples (Beacham *et al.* 2006). A similar pattern was seen in wild fall-run and spring-run Chinook salmon from the Siletz River (Davis *et al.* 2017). Extensive out-of-basin spring-run (and fall-run) Chinook salmon hatchery releases in the Trask River may be an explanation for this pattern. Similarly, although relatively few spring-run Chinook salmon hatchery releases have occurred in the Siletz River, that basin did receive more than 2 million Columbia River hatchery Chinook salmon releases between 1934 and 1952 (Myers *et al.* 1998, Appendix D). Additional sampling and genetic analysis of natural-origin fish across the range of return timing in multiple OC and SONCC rivers would help improve our understanding of the genetic relationships among OC and SONCC Chinook salmon populations. However, the available data does not indicate that spring-run Chinook salmon spawning in rivers on the Oregon Coast, as a group, form a distinct lineage separate from OC fall-run Chinook salmon.

The SONCC area is more thoroughly sampled, particularly with respect to the Rogue River basin. Within the SONCC ESU, it is apparent that the close genetic relationship between geographically proximate spring-run and fall-run Chinook salmon continues to be true when viewed at the within-ESU scale. In particular, in several studies, spring-run and fall-run samples from the Rogue River are more genetically related to each other than either are to samples from other rivers in the SONCC ESU. In other words, within the currently delineated SONCC Chinook salmon ESU, spring-run and fall-run fish spawning in the Rogue River appear to reproduce more with each other than with fall-run fish spawning in other rivers in the ESU. The Panel found that this pattern is similar to what has been reported in the Upper Klamath and Trinity Rivers (Anderson and Garza 2018), and is also apparent in the Puget Sound and Lower Columbia Chinook ESUs.

In addition to neutral genetic variation, adaptive genetic variation has been used to identify differences between individual fish or groups of fish. An example is the gene-region that has been associated with run-timing in Chinook salmon and steelhead, the *GREB1L* gene (otherwise referred to as the *GREB1L* region of the genome). Hess *et al.* (2016), Prince *et al.* (2017) and Thompson *et al.* (2019a) characterized the *GREB1L* region as two alleles (different forms) and three genotypes (different combinations of the two alleles): individuals with two early run-timing alleles (early run homozygotes), individuals with two late run-timing alleles (late run homozygotes), and individuals with one allele for the early and one for the late run-timing (heterozygotes). There are five recent studies that have examined run-time-associated variants in the *GREB1L* region in OC and SONCC Chinook samples (Prince *et al.* 2017; Anderson & Garza 2018; Thompson *et al.* 2019a; O'Malley *et al.* 2020a; O'Malley *et al.* 2020b). These studies have found that heterozygotes are common, indicating that interbreeding between fish homozygous for the spring-run and fall-run variants is commonly occurring. This pattern has been extensively studied in the Rogue River basin of the SONCC ESU (Thompson *et al.* 2019; O'Malley *et al.* 2020a; O'Malley *et al.* 2020b),

where researchers have obtained relatively large sample sizes of fish based on carcass surveys and surveys of captured live fish conducted throughout the run. For the OC, the only river that has been sampled using the GREB1L markers is the Siletz River (Anderson and Garza 2018; Thompson *et al.* 2020). That study also found substantial proportions of heterozygotes, particularly among fish that returned to the river early and were identified as spring-run (29 percent). A similarly high proportion of GREB1L region heterozygotes have been found in other coastal Chinook salmon ESUs (Upper Klamath River, Anderson and Garza 2018; Rogue River, Thompson *et al.* 2019a; Washington Coast, Thompson *et al.* 2019b).

The GREB1L region has been demonstrated to be highly associated with run timing in multiple populations of coastal Chinook salmon (*i.e.*, coastal spring-run Chinook salmon are homozygous for the early alleles, and fall-run Chinook are homozygous for the late alleles – Anderson and Garza 2018, Thompson *et al.* 2019a,b, O'Malley *et al.* 2020, Thompson *et al.* 2020). The finding of substantial proportions of heterozygotes provides evidence of contemporary interbreeding between alternative homozygotes at the GREB1L region. This, in turn, implies that mating among spring-run and fall-run (and likely intermediate timed) fish is common in multiple watersheds (reviewed by Ford *et al.* 2020). Analysis of recombination events (Anderson and Garza 2018, Thompson *et al.* 2020) also indicates that at least in the Upper Klamath River, such interbreeding must have also occurred historically at some level, although the rate of interbreeding was not determined and could be lower than is seen now.

In both the OC and the SONCC ESUs, there is therefore strong evidence from GREB1L region markers that interbreeding between spring-run and fall-run Chinook salmon is common, at least for the two watersheds that have been studied to date (Rogue River, Siletz River). However, the data do not indicate whether the current levels of interbreeding occurred historically under more pristine conditions. Patterns of random genomic variation

(indicative of population history) indicate that spring-run Chinook salmon in the OC and SONCC ESUs are, as a group, not substantially reproductively isolated from fall-run Chinook spawning in the OC and SONCC rivers. There is some indication that spring-run Chinook salmon in the Umpqua River may have somewhat reduced gene flow from other OC fall-run and spring-run Chinook salmon populations, but past hatchery practices may have also influenced this result. As a whole, however, the available data indicate that the spring-run portions of the OC and SONCC ESUs are not substantially reproductively isolated from the fall-run populations in the ESUs. Additional genetic sampling of fish throughout the period of migration in multiple populations, especially in the OC ESU, would be very helpful for further evaluating this question.

#### *Evolutionary Legacy Criterion*

The early run-timing trait is an important component of diversity within the Chinook salmon species. In particular, the trait allows Chinook salmon to access upstream habitats that are inaccessible to later returning fish in some years. Run time diversity as a whole is also expected to increase viability by broadening the portfolio of traits within a species or an ESU, which leads to increased resilience to environmental variation (Quinn *et al.* 2016). Recent reviews of ESU/DPS configurations of Chinook salmon (Anderson *et al.* 2018) and steelhead (Pearse *et al.* 2019) support this point, as does a recent expert workshop report (Ford *et al.* 2020) and the original coastwide status review of Chinook salmon (Myers *et al.* 1998). Recovery plans for Chinook salmon ESUs that contain populations with both spring-run and fall-run fish also emphasize the importance of recovering populations with both life-history strategies (Shared Strategy Development Committee 2007; Dornbush 2013; Pearse *et al.* 2019).

While recognizing the importance of run-timing variation to species and ESU viability, Myers *et al.* (1998) concluded that patterns of genetic variation and patterns of variation for other life-history traits indicated that coastal spring- and fall-run Chinook

salmon shared the same recent evolutionary history. Coastal ESUs were identified based on concordant patterns of genetic, life-history, and geographic variation, with run-timing variation considered to be an important element of diversity within ESUs. Subsequent reports of Upper Klamath Trinity River Chinook salmon and Northern California steelhead have reached the same conclusion (Williams *et al.* 2013, Anderson *et al.* 2018, Pearse *et al.* 2019). Recent genetic studies have greatly increased our knowledge of the genetic basis of run-timing variation, but these studies do not change or invalidate the previous conclusion that spring-run and fall-run Chinook salmon in the currently delineated OC and SONCC Chinook salmon ESUs share a recent evolutionary legacy, and they are, on the whole, more genetically similar to each other than to populations in other ESUs. The two run types display similar characteristics in other life-history traits, and are genetically similar to each other due to a combination of recent common ancestry and ongoing interbreeding. Identifying a spring-run-only Chinook salmon ESU for either the OC or SONCC areas would therefore be inconsistent with our ESU policy, both because of high levels of interbreeding between spring-run and fall-run fish in these ESUs and because spring-run fish, as a group, in these ESUs do not form a distinct evolutionary lineage within the species.

### **Conclusions On The Evolutionarily Significant Unit Analysis**

The Panel concluded, and the WCR concurred, that the best available information indicates that OC and SONCC spring-run Chinook salmon populations do not meet the reproductive isolation and genetic legacy criteria of the ESU Policy. The spring-run phenotype and the spring-run variant within the GREB1L chromosomal region are clearly an important part of the diversity within the Chinook salmon species, but the available data indicate that spring-run Chinook salmon in the OC and SONCC ESUs regularly interbreed with and share a recent evolutionary history throughout the vast majority of their genome with fall-run Chinook salmon in the same rivers.

### **Final Determination**

Section 4(b)(1) of the ESA requires that NMFS make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and taking into account those efforts, if any, being made by any state or foreign nation, or political subdivisions thereof, to protect and conserve the species. We have independently reviewed the best available scientific and commercial information, including the information provided in the petitions and public comments submitted on the 90-day findings (85 FR 20476, April 13, 2020; 86 FR 14407, March 16, 2021), the ESU configuration review report, and other published and unpublished information, and have consulted with species experts and individuals familiar with the OC and SONCC Chinook salmon ESUs.

Our determination set forth here is based on a synthesis and integration of the foregoing information. Based on our consideration of the best available scientific and commercial information, as summarized here and in the ESU configuration report, we conclude that OC and SONCC spring-run Chinook salmon populations do not constitute ESUs. Accordingly, OC and SONCC spring-run Chinook salmon populations do not meet the statutory definition of a species, and thus, OC and SONCC spring-run Chinook salmon populations do not warrant listing under the ESA.

This is a final action, and, therefore, we are not soliciting public comments.

## **References**

A complete list of all references cited herein is available upon request (see **FOR FURTHER INFORMATION CONTACT**).

## **Authority**

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: August 6, 2021.

Samuel D. Rauch, III,



Deputy Assistant Administrator for Regulatory Programs,  
National Marine Fisheries Service.

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